UPDATES TO THE EDUCATIONAL PROGRAM FOR THE COURSE «INFORMATICS IN MEDICINE»

for the major 7-07-0911-03 «Dentistry»
for the 2026/2027 academic year

№	Amendments	Reference
1.	The following literature to be used in the educational process **Main:** 1. Medical Informatics in Modules: образ. пособие/И.Е.Булах, Л.П.Войтенко, О.С. Алита и др. – К. : ВСВ «Медицина», 2014. – 152 с. **Supplementary:** 2. Shelamova, M. A. Organization of calculation and graphical representation of biomedical data in EXCEL : teaching manual / M. A. Shelamova, V. G. Leschenko. Minsk : BSMU, 2017. - 48 c. 3. Shelamova, M. A. Organization and processing of medical databases in Excel: teaching manual / Minsk : BSMU, 2018. - 48 c.	Department meeting
2.	Amendments have been made to the thematic plan and to the teaching and methodological chart (Appendices 1 and 2).	Department meeting Policy on the Use of Artificial Intelligence in the Educational Process at Belarusian State Medical University (BSMU), dated September 29, 2025
3.	The course has been supplemented with the following section: Содержание учебной дисциплины дополнено разделом: **10. «Introduction into Artificial Intelligence»**: Basic principles of artificial intelligence (AI). Data and machine learning algorithms (classification and regression), neural networks. Pattern recognition and computer vision in medicine (medical image analysis, pathology detection). AI risks (errors, hallucinations, fakes, data security). AI capabilities (big data processing, acceleration of the support for decision making). Legal regulation and ethics of AI application in healthcare. Development of human consciousness and intelligence to manage AI technologies for the greater good of humanity.	Department meeting Policy on the Use of Artificial Intelligence in the Educational Process at Belarusian State Medical University (BSMU), dated September 29, 2025

4.	Amendments have been made to the list of practical skills (Appendix 3)	Department meeting Policy on the Use of Artificial Intelligence in the Educational Process at Belarusian State Medical University (BSMU), dated September 29, 2025

Educational program has been revised and approved at a meeting of the Department of Medical and Biological Physics (Minutes No. 9 dated May 21, 2026)

Head of the of the Medical and Biological Physics Department _____ M.V.Goltsev

APPROVED BY

Dean of the Medical Faculty of Foreign Students _____ O.S. Ishutin

Appendix 1

THEMATIC PLAN

Section (topic) name	Number of classroom hours
	practical
1. Information and information processes. Information technologies in Medicine	**2**
2. Methods and techniques for preparing text documents using the MS Word word processor	**2**
3. Methods and techniques for working with MS Excel spreadsheets	**6**
3.1. Creation, editing, and formatting of spreadsheets. Processing of scientific research data sets.	2
3.2. Graphical representation of medical data arrays	2
3.3. Using templates to prepare professional documents	2
4. Statistical Analysis of Medical Research Data Using MS Excel	**6**
4.1. Methods of descriptive statistics. Estimation of population parameters from its sample	2
4.2. Using the Analysis ToolPak for the statistical processing of medical data. Graphical representation of the statistical distribution of a sample.	2
4.3. Correlation analysis methods	2
5. Data organization, storage, and processing technologies in the MS Access database management system	**6**
5.1. Database design principles. Using queries to retrieve data.	2
5.2. Specifying conditions for data selection in queries	2
5.3. Summarizing results in the database	2
6. Preparing a scientific presentation using MS PowerPoint	**2**
7. Fundamentals of Modeling in Biology and Medicine. Local and Global Computer Networks. Telemedicine. Distance Learning Systems.	**2**
8. Information Security. Methods and Means of Information Protection	**2**
9. Specialized medical software	**4**
9.1. Medical information systems used in healthcare organizations. Electronic patient records.	2
9.2. Collection and processing of primary medical information	2

Section (topic) name	Number of classroom hours
	practical
10. Introduction to Artificial Intelligence	**4**
10.1. Fundamentals of AI in Medicine	2
10.2. Medical image recognition	2
Total hours	**36**

Appendix 2

CURRICULUM AND INSTRUCTIONAL MAP FOR THE COURSE «INFORMATICS IN MEDICINE» MODULE «INFORMATION TECHNOLOGIES IN HEALTHCARE»

Section or topic number	Section of topic title	Number of classroom hours	Literature	Practical skill	Forms of assessment	
		practical			Practical skill	current / interim assessment
1st semester						
	Practical sessions					
1.	Information and information processes. Information technologies in Medicine	2	1	Performing calculations using formulas and functions. Creating charts in MS Excel.	Survey	Survey
2.	Methods and techniques for preparing text documents using the MS Word word processor	2	1	Performing calculations using formulas and functions. Creating charts in MS Excel.	Electronic Workbook	Survey
3.1.	Creation, editing, and formatting of spreadsheets. Processing of scientific research data sets.	2	1	Performing calculations using formulas and functions. Creating charts in MS Excel.	Electronic Workbook	Survey
3.2.	Graphical representation of medical data arrays	2	1	Performing calculations using formulas and functions. Creating charts in MS Excel.	Electronic Workbook	Survey
3.3.	Using templates to prepare professional documents	2	1	Performing calculations using formulas and functions	Electronic Workbook	Контрольная работа
4.1.	Methods of descriptive statistics. Estimation of population parameters from its sample	2	1-3	Statistical processing of biomedical data: determination of statistical characteristics for the sample and the population, identification of relationships using built-in MS Excel statistical	Electronic Test	Survey

				functions and specialized data analysis tools		
4.2.	Using the Analysis ToolPak for the statistical processing of medical data. Graphical representation of the statistical distribution of a sample	2	1-3	Statistical processing of biomedical data: determination of statistical characteristics for the sample and the population, identification of relationships using built-in MS Excel statistical functions and specialized data analysis tools	Performing calculations using built-in functions. Analyzing the results and formulating conclusions, followed by an oral test	Survey
4.3.	Correlation analysis methods	2	1-3	Statistical processing of biomedical data: determination of statistical characteristics for the sample and the population, identification of relationships using built-in MS Excel statistical functions and specialized data analysis tools	Performing calculations using built-in functions. Analyzing the results and formulating conclusions, followed by an oral test *	Survey
5.1.	Database design principles. Using queries to retrieve data	2	1	Using PivotTables for Data Analysis	Electronic Workbook	Survey
5.2.	Specifying conditions for data selection in queries	2	1	Using queries to retrieve data from databases	Electronic Workbook	Survey
5.3.	Summarizing results in the database	2	1	Using PivotTables for Data Analysis	Electronic Workbook	Test*
6.	Preparing a scientific presentation using MS PowerPoint	2	1	Creation and presentation of multimedia presentations for showcasing scientific work using MS PowerPoint	Electronic Workbook	Survey
7.	Fundamentals of Modeling in Biology and Medicine. Local and Global Computer Networks. Telemedicine. Distance Learning Systems	2	1	Use of educational and scientific information resources on local networks and the Internet	Survey	Survey
8.	Information Security. Methods and Means of Information Protection	2	1	Proficiency in methods for protection against unauthorized	Survey	Survey

				data access and the impact of malicious software in medical information systems		
9.1.	Medical information systems used in healthcare organizations. Electronic patient records	2	1	Working with the specialist's automated workstation software	Electronic Workbook *	Survey
9.2.	Collection and processing of primary medical information	2	1	Working with the specialist's automated workstation software	Interview	Survey
10.1	Fundamentals of AI in Medicine	2	1	Preparing medical data for AI. Solving a classification problem in machine learning.	Electronic Workbook	Test*
10.2.	Medical image recognition	2	1	Solving the detection problem using a neural network	Electronic Workbook	Survey Pass
	Total hours	**36**				

* It is a mandatory form of ongoing assessment

Appendix 3

LIST OF PRACTICAL SKILLS

Name of the practical skill	Form of assessment
1. Performing calculations using formulas and functions. Creating charts in MS Excel	Electronic workbook
2. Statistical processing of biomedical data: determination of statistical characteristics for the sample and the population, identification of relationships using built-in MS Excel statistical functions and specialized data analysis tools	Performing calculations using built-in functions. Analyzing the results and formulating conclusions, followed by an oral test
3. Using PivotTables for Data Analysis	Electronic workbook
4. Using queries to retrieve data from databases	Electronic workbook
5. Creation and presentation of multimedia presentations for showcasing scientific work using MS PowerPoint	Electronic workbook
6. Use of educational and scientific information resources on local networks and the Internet	Survey
7. Proficiency in methods for protection against unauthorized data access and the impact of malicious software in medical information systems	Survey
8. Working with the specialist's automated workstation software	Electronic workbook
9. Preparing medical data for AI	Electronic workbook
10. Solving a classification problem in machine learning	Electronic workbook
11. Solving the detection problem using a neural network	Electronic workbook